

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Paul Sewell on 9/15/08.

Please amended claim 22 as follows:

22. (Currently amended) A method for determination of soil stiffness levels of a soil area, in which case one and the same self-propelled apparatus (1) is used not only to determine the absolute soil stiffness level (k_B) when located on at least one predetermined soil subarea (3) of the soil area but also to determine a plurality of relative soil stiffness levels(s) while crossing over a plurality of soil subareas of the soil area, comprising:

moving a vibration unit (5) into a predetermined soil subarea (3), in order to determine an absolute soil stiffness level (k_B), a first time-variable excitation force is applied by means of the vibration unit (5) in permanent contact with the soil surface, whereas the vibration unit (5) and the predetermined soil subarea (3) represent a single oscillating system, and first data items of a first oscillation response of the oscillating system and second data items of the first time-variable excitation force are determined, and an absolute soil stiffness level (k_B) of the predetermined soil subarea (3) is determined from the first and second data items; and

moving the vibration unit (5) to the soil surface of one of the soil subarea of the soil area, in order to determine a plurality of relative soil stiffness levels(s) of a plurality of soil subareas, a second time-variable excitation force acts on the vibration unit (5) in such a way that the vibration unit (5) is lifted off the soil surface (2) and can thus be moved in a jumping manner to a plurality of the soil subareas, third data items of a second oscillation response of the oscillation of the vibration unit (5), caused by the second excitation force, and fourth data items of the oscillation of the second excitation force are determined, and relative soil stiffness levels (k_B) of the soil subarea are determined successively and continuously over the soil area from the third and fourth data items, whereas

the amplitude of the first harmonic and of subharmonics during periodic excitation of the vibration unit (5) by the second excitation force are determined as third data items of the second oscillation response, preferably third data items are determined in soil subarea, which are located at different points, in a soil area together with the relevant absolute values, and are stored in order to carry out a calibration process which allows measured relative values to be represented as absolute values, whereas

the soil area has the same soil composition, except for a tolerance, the amplitude values of the third data items with respect to the maximum oscillation level of the excitation oscillation with individual weighting factors to be determined forming a sum, whereas the sum value is the respective location-specific absolute value, and the individual weighting factors are determined from a plurality of measurements, and whereas the numbers of measurements corresponds to the number of weighting factors, and the magnitude of the sum after a calibration process is a

measure of an absolute soil compaction level or of an absolute soil stiffness of a soil subarea which is just been moved over.

Allowable Subject Matter

Claims 1-8 and 10-24 are allowed.

Claims 1-8 and 10-24 are allowable over the prior art of record, none of the prior art whether together singularly or in combination to teach the claimed combination as recited. The closest reference No. 6,431,790 does not disclose or suggest the improvement of the instant application comprising: determining an absolute soil stiffness by a first time-variable excitation force with maximum first oscillation level deducing a first and second response data and determining a plurality of relative soil stiffness levels by a second time-variable excitation force such that the vibration unit is lifted off deducing a third and fourth response data representing a lowest subharmonic frequency; the first and second data are used to determine an absolute soil stiffness level while the third and fourth data are used to determine a plurality of relative soil stiffness levels as cited in independent claims 1, 22, 23, and 24; in addition, amplitude values of the third data items with respect to the maximum oscillation level of the excitation oscillation with individual weighting factors to be determined forming a sum, in which case the sum value is the respective location-specific absolute value, and the individual weighting factors are determined from a plurality of measurements, in which case the number of measurements corresponds to the number of weighting factors, and in which case the magnitude of the sum after a calibration process is a measure of an absolute soil compaction level or of an absolute soil stiffness of a soil subarea which is just been moved over as cited in claims 22, 23, and 24.

Reference '790 teaches Fourier analysis for soil stiffness when the applied apparatus maintains contact with the ground, lifts off the ground, or shows sign of jumping.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN M. LE whose telephone number is (571)272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Toan Le

/Michael P. Nghiem/
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